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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,366	07/01/2003	Kenichi Shimomura	2611-0192P	1162
2292	7590	08/23/2007	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH			LEE, DAVID J	
PO BOX 747			ART UNIT	
FALLS CHURCH, VA 22040-0747			PAPER NUMBER	
			2613	
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			08/23/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

**Office Action Summary**

Application No.

10/609,366

Applicant(s)

SHIMOMURA ET AL.

Examiner

David Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8-11 and 13 is/are rejected.
- 7) ☒ Claim(s) 2,7,12 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/1/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

1. Claim 12 is objected to because of the following informalities: "according to claim 12" should be changed to --according to claim 11--. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 5, 6, 10, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martensson et al. (US Pub. No. 2003/0219259 A1) in view of Sasai et al. (US Patent No. 6,459,519 B1).

Regarding claims 1, 6, 11, and 13, Martensson an optical transmitter, comprising an optical modulation processing unit that includes: a signal carrier-suppressed pulse modulating unit that performs signal carrier-suppressed pulse modulation on a light source signal to thereby create a carrier-suppressed-return-to-zero signal (20 of fig. 9; see also paragraph 0030); a phase modulating unit that performs phase modulation on a data signal based on the carrier-suppressed-return-to-zero signal to thereby convert the data signal into a phase-modulated signal (50 of fig. 9). Martensson does not expressly disclose an optical filtering unit that filters out redundant frequency components included in the phase-modulated signal. Sasai, from a similar field of endeavor, teaches an optical transmitter, comprising an optical modulation processing unit that

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includes: a signal carrier-suppressed pulse modulating unit that performs signal carrier-suppressed pulse modulation on a light source signal (120-1 of fig. 3), a phase modulating unit that performs phase modulation on a data signal (120-2 of fig. 3; see e.g., col. 18, line 44) and an optical filtering unit that filters out redundant frequency components included in the phase-modulated signal (130 of fig. 1). A skilled artisan would have been motivated to incorporate an optical filtering unit in the system of Martensson in order to filter out either the upper or lower sideband. It would have been obvious to a skilled artisan at the time of invention to incorporate a filtering unit in order to filter out sidebands to increase transmission bandwidth.

Regarding claims 5 and 10, Martensson teaches that the signal carrier-suppressed pulse modulating unit is a Mach-Zender interferometer optical modulator (see middle of paragraph 0022).

4. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martensson in view of Tsushima et al. (US Patent No. 5,305,134).

Regarding claims 3 and 8, Martensson teaches the limitations of claims 1 and 6 but does not expressly disclose that there are plurality of modulation units whose outputs are multiplexed. It is well known to implement this kind of structure. For example, Tsushima discloses a plurality of modulation units whose outputs are multiplexed (see fig. 4). It would have been obvious to a skilled artisan at the time of invention to use a plurality of modulators and combine their outputs using a multiplexer in order to increase transmission bandwidth and speed.

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5. Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martensson in view of Naito et al. (US Patent No. 5,228,043).

Regarding claims 4 and 9, Martensson teaches the limitations of claims 1 and 6 but does not expressly disclose a differential coding unit that performs differential-coding on the data signal. Performing differential coding on a data signal is well known in the art. Naito teaches an optical transmission system comprising a differential coder (203 of fig. 26) supplying a data signal to a phase modulator (202 of fig. 26). It would have been obvious to a skilled artisan at the time of invention to incorporate differential coding in order to optimize signal transmission and increase efficiency, stability, and accuracy.

#### ***Allowable Subject Matter***

6. Claims 2, 7, 12, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

7. Applicants' arguments filed 5/30/2007 have been fully considered but they are not persuasive.

Applicants argue that Martensson does not disclose that the phase modulator of Martensson modulates a data signal based on the CSRZ signal (see end of pg. 9 to beginning of pg. 10 of Applicants' Remarks). Instead, Applicants allege that the phase modulator of Martensson only modulates the data signal based on an RZ or NRZ signal, rather than a CSRZ

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signal. Examiner respectfully disagrees. The phase modulator of Martensson (e.g., 50 of fig. 9) is used to provide “supplementary phase modulation” in order to enhance the system’s nonlinear tolerance. Although not shown in the drawings, this phase modulation is provided in addition to an already existing phase modulator (see paragraph 30: “The phase modulation...may be applied to transmitters that *already incorporate phase modulation*.”). Furthermore, Martensson discloses that the additional phase modulation can be applied to “existing transmission links using...CSRZ” (see paragraph 30). According to these disclosures, it is clear that a CSRZ signal is provided to a supplementary phase modulator in order to enhance non-linear tolerance of the signals. Accordingly, Martensson discloses a phase modulator that modulates a data signal based on a CSRZ signal.

Applicants also argue that Sasai fails to teach an optical filtering unit that filters out redundant frequency components in a phase-modulated signal (see second full paragraph of pg. 10 of Applicants’ Remarks). Examiner respectfully disagrees. Sasai clearly discloses a phase modulator (modulators 120-1, 120-2 of fig. 3; note that the carriers are “optical-phase-modulated”: see col. 18, line 44). The phase-modulated signal, which is a double-modulated optical signal with upper and lower sidebands (see col. 18, lines 43-59) is then filtered through filter 130 of fig. 3. This filter serves is set so “that only the component of the upper sideband or the lower sideband out of the components of the double-modulated optical signal...can be extracted” (col. 19, lines 51-55). Reasonably understood, this reads on the limitation “an optical filtering unit that filters out redundant frequency components including in the phase-modulated optical signal.”

Additionally, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The rejection of the instant claims are based on a combination of references, which teach the filtering of the redundant frequency components in the CSRZ phase modulated signal. It is noted that the filtering of either the upper or lower sidebands, regardless of data bit rate, will increase the transmission bandwidth efficiency without jeopardizing data transmission.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



David Lee  
Patent Examiner



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